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**United States Patent** [19][11] **Patent Number:** **6,029,171****Smiga et al.**[45] **Date of Patent:** **Feb. 22, 2000**

[54] **METHOD AND APPARATUS FOR GROUP ACTION PROCESSING BETWEEN USERS OF A COLLABORATION SYSTEM**

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[75] **Inventors:** **Brian Smiga**, San Francisco; **Dennis Buchheim**, Palo Alto, both of Calif.; **Thomas Hagan**, Boston, Mass.; **David Wadhvani**, San Francisco; **Norman Scott Storkel**, Palo Alto, both of Calif.

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*Primary Examiner*—Wayne Amsbury

*Assistant Examiner*—David Y. Jug

*Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

[73] **Assignee:** **Actioneer, Inc.**, San Francisco, Calif.

[57] **ABSTRACT**

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[58] **Field of Search** ..... **707/1-540; 395/671-684; 709/106-304**

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A natural language-based information organization and collaboration tool for a computer system is disclosed. The present invention includes an apparatus and method for processing text expressions in a computer system, the apparatus including: 1) an object database defining an information object with an associated keyword; 2) a user input device for receiving an input text expression; 3) a parsing device for identifying the keyword in the input text expression, the parsing device including functions for linking the input text expression to the information object based on the keyword identified in the input text expression; and 4) a user output device for displaying to the user the identity of the information object to which the input text expression was linked. The apparatus of the present invention further includes supplemental information in the object database which is related to the information object, the user output device further including functions for displaying the supplemental information when a corresponding keyword is identified in the input text expression. The apparatus of the present invention further includes a method and apparatus for collaboration between users of a time and project management system.

**24 Claims, 26 Drawing Sheets**

**OBJECT TYPE TABLE**

KEY	TYPE	DESCRIPTION
0	ENVELOPE	"CONTAINER" OF A KEYNOTE THAT IS BEING SENT
1	LIST ITEM	ACTUAL KEYNOTE BODY AND STATUS INFORMATION
2	PROJECT	ACTIONEER PROJECT
3	SIMPLE DATE	NON-RECURRING (DUE) DATE
4	RECURRING DATE	RECURRING (DUE) DATE
5	PERSON	INDIVIDUAL CONTACT
6	LIST	ACTIONEER ACTION OR MEMO LIST
7	DELEGATE	PERSON TO WHOM A COLLABORATIVE NOTE IS DELEGATED
8	FYI RECIPIENT	PERSON TO WHOM A NOTE IS SENT FOR INFORMATION PURPOSES ONLY
9	ATTACHED PROJECT	PROJECT ATTACHED TO A NOTE
10	ATTACHED PERSON	PERSON ATTACHED TO A NOTE
11	KEYWORD	WORD(S) USED BY THE ACTIONEER PARSER TO INTERPRET A NOTE'S TEXT
12	PHYSICAL ADDRESS	HOME, WORK, ETC. ADDRESS
13	EMAIL ADDRESS	INTERNET, EXCHANGE, ETC. EMAIL ADDRESS
14	PHONE NUMBER	HOME, WORK, ETC. PHONE NUMBER
15	EMAIL TO	EMAIL ADDRESS TO SEND A NOTE TO (DELEGATE)
16	EMAIL FYI	EMAIL ADDRESS TO SEND A NOTE AS A "CC" (FYI RECIPIENT)
17	ENVELOPE CREATOR	PERSON WHO ORIGINALLY CREATED A PARTICULAR ENVELOPE
18	ENVELOPE SENDER	PERSON WHO SENT A PARTICULAR ENVELOPE TO THE CURRENT RECIPIENT

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TITLE: Method and apparatus for group action processing between users of a collaboration system

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INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Smiga; Brian	San Francisco	CA	N/A	N/A
Buchheim; Dennis	Palo Alto	CA	N/A	N/A
Hagan; Thomas	Boston	MA	N/A	N/A
Wadhvani; David	San Francisco	CA	N/A	N/A
Storkel; Norman Scott	Palo Alto	CA	N/A	N/A

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ABSTRACT:

A natural language-based information organization and collaboration tool for a computer system is disclosed. The present invention includes an apparatus and method for processing text expressions in a computer system, the apparatus including: 1) an object database defining an information object with an associated keyword; 2) a user input device for receiving an input text expression; 3) a parsing device for identifying the keyword in the input text expression, the parsing device including functions for linking the input text expression to the information object based on the keyword identified in the input text expression; and 4) a user output device for displaying to the user the identity of the information object to which the input text expression was linked. The apparatus of the present invention further includes supplemental information in the object database which is related to the information object, the user output device further including functions for displaying the supplemental information when a corresponding keyword is identified in the input text expression. The apparatus of the present invention further includes a method and apparatus for collaboration between users of a time and project management system.

24 Claims, 27 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 26

CLAIMS:

What is claimed is:

1. A method of collaborating on projects, using a first instance of a messaging system and a second instance of the messaging system, the method comprising the computer implemented steps of:

permitting entry of a message in the first instance of the messaging system;

parsing the message to identify a keyword;

linking the message to an information object based on the keyword identified in the message;

creating a header for the message based on the keywords;

sending the message, using the header, to the second instance of the messaging system;

receiving the message at the second instance of the messaging system;

displaying a selection of reply options;

generating a reply including an automatic reply content based on the selection;

creating a reply header for the reply based on the message content; and

sending the reply, using the reply header, to the first instance of the messaging system; and

entering an entry into a first calendar and a first list based on the message in the first instance of the messaging system;

wherein the selection of reply options include an affirmative, a negative, and an other.

2. The method of claim 1, further comprising:

filing a copy of the message in the first instance of the messaging system.

3. The method of claim 1, further comprising:

filing a copy of the message and the reply in the second instance of the messaging system.

4. The method of claim 1, further comprising:

entering an entry into a second calendar and a second list based on the message, in the second instance of the messaging system.

5. The method of claim 1 wherein said entry is entered in a pencil.

6. The method of claim 4 wherein said entry is entered in a pencil.

7. The method of claim 4, further comprising:

continuing a collaboration when the selection is the other, until the selection is the affirmative or the negative;

completing the collaboration when the reply option is the affirmative; and

aborting the collaboration when the reply option is the negative.

8. The method of claim 7, wherein the step of aborting the collaboration comprises:

deleting the entry in the first calendar and the first list in the first instance of the messaging system; and

deleting the entry in the second calendar and the second list in the second instance of the messaging system.

9. The method of claim 7 wherein said step of completing the collaboration comprises:

updating the entry in the first calendar and the first list based on the reply from the second instance of the messaging system; and

updating the entry in the second calendar and the second list based on the reply.

10. The method of claim 9, wherein said step of updating comprises entering said entry using a pen.

11. The method of claim 10 wherein using the pen indicates using a different color from using the pencil.

12. The method of claim 7 wherein said step of continuing the collaboration comprises continuing a negotiation cycle, the negotiation cycle comprising:

receiving the reply with the reply option of the other;

displaying the selection of the reply options;

generating a new reply, including a new automatic reply content based on the selection;

creating a new header; and

sending the new reply, using the new header.

13. The method of claim 12, further comprising the steps of:

determining whether the new reply is the affirmative, the negative, or the other;

executing another negotiation cycle if the reply is the other; and

ending the collaboration if the reply is the affirmative or the negative.

14. The method of claim 1, wherein said first instance and said second instance of said messaging system are implemented on a peer-to-peer distributed system.

15. The method of claim 14, wherein said peer-to-peer distributed system comprises using a network to connect a plurality of computer systems.

16. A method of collaborating on projects, the method comprising the computer implemented steps of:

receiving a message from an originator;

parsing the message to identify a keyword indicating an intended recipient for the message;

linking the message to an address of the intended recipient;

sending the message to the intended recipient;

receiving the message at a system of the intended recipient;

displaying a selection of reply options;

generating a reply, including an automatic reply content based on the selection;

sending the reply;

determining if the intended recipient is responding to the originator or sending the message to a third party based on the selection;

sending the reply to the originator if the recipient is responding to the originator;

if the intended recipient is sending the message to a third party:

parsing the message to identify a keyword indicating the third party for the message;

linking the message to an address of the third party;

sending the message to the third party; and

entering an entry into a calendar and a list of the originator.

17. The method of claim 16, wherein the selection of reply options include an affirmative, a negative, and an other.

18. The method of claim 17, wherein the selection other includes delegating the message to the third party.

19. The method of claim 17, further comprising:

continuing a collaboration when the selection is the other, until the selection is the affirmative or the negative;

completing the collaboration when the reply option is the affirmative; and

aborting the collaboration when the reply option is the negative.

20. The method of claim 19, wherein the step of aborting the collaboration comprises:

deleting an entry in a calendar and a list generated based on the message.

21. The method of claim 19 wherein said step of completing the collaboration comprises:

updating entries in calendars and lists of the originator and the intended recipient based on the reply, such that the originator and the intended recipient have calendar entries and list entries based on the collaboration.

22. The method of claim 19 wherein said step of completing the collaboration comprises:

updating entries in calendars and lists any other parties involved in the collaboration.

23. The method of claim 16, further comprising:

entering an entry into a calendar and a list of the intended recipient.

24. The method of claim 16, further comprising:

modifying the entry in the calendar and the list based on a response from the intended recipient.